General

Guideline Title

The epilepsies: the diagnosis and management of the epilepsies in adults and children in primary and secondary care.

Bibliographic Source(s)

National Institute for Health and Clinical Excellence (NICE). The epilepsies: the diagnosis and management of the epilepsies in adults and children in primary and secondary care. London (UK): National Institute for Health and Clinical Excellence (NICE); 2012 Jan. 117 p. (Clinical guideline; no. 137).

Guideline Status

This is the current release of the guideline.

This guideline updates previous versions:

National Collaborating Centre for Primary Care. The diagnosis and management of the epilepsies in adults and children in primary and secondary care. London (UK): Royal College of General Practitioners; 2004 Oct. 525 p. [324 references]

National Institute for Clinical Excellence (NICE). Newer drugs for epilepsy in adults. London (UK): National Institute for Clinical Excellence (NICE); 2004 Mar. 36 p. (Technology appraisal; no. 76).

National Institute for Clinical Excellence (NICE). Newer drugs for epilepsy in children. London (UK): National Institute for Clinical Excellence (NICE); 2004 Apr. 39 p. (Technology appraisal; no. 79).

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- August 31, 2016 – Opioid pain and cough medicines combined with benzodiazepines : A U.S. Food and Drug Administration (FDA) review has found that the growing combined used of opioid medicines with benzodiazepines or other drugs that depress the central nervous system (CNS) has resulted in serious side effects, including slowed or difficult breathing and deaths. FDA is adding Boxed Warnings to the drug labeling of prescription opioid pain and prescription opioid cough medicines and benzodiazepines.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Labelling of Recommendations:

- New recommendations are labelled by adding [new 2012] to the end of the recommendation.
- Unchanged recommendations where the evidence has been reviewed for the 2012 update are labelled as [2012].
- Unchanged recommendations from 2004, where the evidence has not been formally reviewed for the 2011 update, are labelled as [2004].
- Where evidence has not been reviewed, but there have been minor changes in 2012 to the wording of a 2004 recommendation, these are labelled as [2004, amended 2012].

Note: In this guideline, the term 'adults' is used to describe people who are aged 18 years and older, and 'children' those who are aged 28 days to 11 years. 'Young people' describes those who are aged 12 to 17 years. 'Older people' is used to describe people who are aged 65 years or older – this age range is based on evidence reviewed by the Guideline Development Group (GDG). However, it is recognised that there is a variable age range (15–19 years) at which care is transferred between child and adult health services by local healthcare trusts and primary care organisations.

Principle of Decision Making

Healthcare professionals should adopt a consulting style that enables the child, young person or adult with epilepsy, and their family and/or carers as appropriate, to participate as partners in all decisions about their healthcare, and take fully into account their race, culture, and any specific needs. [2004]

Coping with Epilepsy

Children, young people and adults with epilepsy and their families and/or carers should be empowered to manage their condition as well as possible. [2004]

Adults should receive appropriate information and education about all aspects of epilepsy. This may be best achieved and maintained through structured self-management plans. [2004]

In children and young people, self-management of epilepsy may be best achieved through active child-centred training models and interventions. [2004]

Healthcare professionals should highlight the Expert Patients Programme (http://www.expertpatients.co.uk/) to children, young people and adults with epilepsy who wish to manage their condition more effectively. [2004, amended 2012]

Information

Children, young people and adults with epilepsy and their families and/or carers should be given, and have access to sources of, information about (where appropriate):

- Epilepsy in general
- Diagnosis and treatment options
- Medication and side effects
- Seizure type(s), triggers, and seizure control
- Management and self-care
- Risk management
- First aid, safety and injury prevention at home and at school or work
- Psychological issues
- Social security benefits and social services
- Insurance issues
- Education and healthcare at school
- Employment and independent living for adults
- Importance of disclosing epilepsy at work, if relevant (If further information or clarification is needed, voluntary organisations should be contacted.)
- Road safety and driving
- Prognosis

- Sudden death in epilepsy (SUDEP)
- Status epilepticus
- Life style, leisure and social issues (including recreational drugs, alcohol, sexual activity, and sleep deprivation)
- Family planning and pregnancy
- Voluntary organisations, such as support groups and charitable organisations, and how to contact them [2004]

The time at which this information should be given will depend on the certainty of the diagnosis and the need for confirmatory investigations. [2004]

Information should be provided in formats, languages, and ways that are suited to the child, young people and adults' requirements. Consideration should be given to developmental age, gender, culture, and stage of life of the person. [2004]

If children, young people and adults and families and/or carers have not already found high-quality information from voluntary organisations and other sources, healthcare professionals should inform them of different sources (using the Internet, if appropriate: see, for example, the website of the Joint Epilepsy Council of the UK and Ireland, www.jointepilepsycouncil.org.uk). [2004]

Adequate time should be set aside in the consultation to provide information, which should be revisited on subsequent consultations. [2004]

Checklists should be used to remind children, young people and adults, and healthcare professionals, about information that should be discussed during consultations. [2004]

Everyone providing care or treatment for children, young people and adults with epilepsy should be able to provide essential information. [2004]

The child, young person or adult with epilepsy and their family and/or carers as appropriate should know how to contact a named individual when information is needed. This named individual should be a member of the healthcare team and be responsible for ensuring that the information needs of the child, young person or adult and/or their family and/or carers are met. [2004]

The possibility of having seizures should be discussed, and information on epilepsy should be provided before seizures occur, for children, young people and adults at high risk of developing seizures (such as after severe brain injury), with a learning disability, or who have a strong family history of epilepsy. [2004]

Children, young people and adults with epilepsy should be given appropriate information before they make important decisions (for example, regarding pregnancy or employment). [2004]

Sudden Unexpected Death in Epilepsy (SUDEP)

Information on SUDEP should be included in literature on epilepsy to show why preventing seizures is important. Tailored information on the person's relative risk of SUDEP should be part of the counselling checklist for children, young people and adults with epilepsy and their families and/or carers. [2004]

The risk of SUDEP can be minimized by:

- Optimising seizure control
- Being aware of the potential consequences of nocturnal seizures [2004]

Tailored information and discussion between the child, young person or adult with epilepsy, family and/or carers (as appropriate) and healthcare professionals should take account of the small but definite risk of SUDEP. [2004]

Where families and/or carers have been affected by SUDEP, healthcare professionals should contact families and/or carers to offer their condolences, invite them to discuss the death, and offer referral to bereavement counselling and a SUDEP support group. [2004]

Following a First Seizure

Children, young people and adults presenting to an Accident and Emergency department following a suspected seizure should be screened initially. This should be done by an adult or paediatric physician with onward referral to a specialist* when an epileptic seizure is suspected or there is diagnostic doubt. [2004]

Protocols should be in place that ensure proper assessment in the emergency setting for children, young people and adults presenting with an epileptic seizure (suspected or confirmed). [2004]

The information that should be obtained from the adult and/or family or carer after a suspected seizure is contained in Appendix D of the original guideline document. [2004]

The information that should be obtained from the child or young person and/or parent or carer after a suspected seizure is contained in Appendix D of the original guideline document. [2004]

It is recommended that all adults having a first seizure should be seen as soon as possible** by a specialist in the management of the epilepsies to ensure precise and early diagnosis and initiation of therapy as appropriate to their needs. [2004]

It is recommended that all children and young people who have had a first nonfebrile seizure should be seen as soon as possible** by a specialist in the management of the epilepsies to ensure precise and early diagnosis and initiation of therapy as appropriate to their needs. [2004]

At the initial assessment for a recent onset seizure, the specialist should have access to appropriate investigations. [2004]

In a child, young person or adult presenting with an attack, a physical examination should be carried out. This should address their cardiac, neurological and mental status, and should include a developmental assessment where appropriate. [2004]

Essential information on how to recognise a seizure, first aid, and the importance of reporting further attacks should be provided to a child, young person or adult who has experienced a possible first seizure, and their family/carer/parent as appropriate. This information should be provided while the child, young person or adult is awaiting a diagnosis and should also be provided to their family and/or carers. [2004]

*For adults, a specialist is defined throughout as a medical practitioner with training and expertise in epilepsy. For children and young people, a specialist is defined throughout as a paediatrician with training and expertise in epilepsy.
**The Guideline Development Group considered that with a recent onset suspected seizure, referrals should be urgent, meaning that patients should be seen within 2 weeks.

Diagnosis

The diagnosis of epilepsy in adults should be established by a specialist medical practitioner with training and expertise in epilepsy. [2004]

The diagnosis of epilepsy in children and young people should be established by a specialist paediatrician with training and expertise in epilepsy. [2004]

Children, young people and adults and their families and/or carers should be given an opportunity to discuss the diagnosis with an appropriate healthcare professional. [2004]

A detailed history should be taken from the child, young person or adult and an eyewitness to the attack, where possible, to determine whether or not an epileptic seizure is likely to have occurred. [2004]

The clinical decision as to whether an epileptic seizure has occurred should then be based on the combination of the description of the attack and different symptoms. Diagnosis should not be based on the presence or absence of single features. [2004]

It may not be possible to make a definite diagnosis of epilepsy. If the diagnosis cannot be clearly established, further investigations (see the 'Investigations' section below) and/or referral to a tertiary epilepsy specialist* (see the second recommendation under the section 'Referral for Complex or Refractory Epilepsy' below) should be considered. Follow-up should always be arranged. [2004]

Where non-epileptic attack disorder is suspected, suitable referral should be made to psychological or psychiatric services for further investigation and treatment. [2004]

Prospective recording of events, including video recording and written descriptions, can be very helpful in reaching a diagnosis. [2004]

*In this recommendation, 'centre' has been replaced with 'specialist' for consistency across recommendations.

Investigations

Information should be provided to children, young people and adults and families and/or carers as appropriate on the reasons for tests, their results and meaning, the requirements of specific investigations, and the logistics of obtaining them. [2004]

All investigations for children should be performed in a child-centred environment. [2004]

Electroencephalogram (EEG)

Children, young people and adults requiring an EEG should have the test performed soon after it has been requested*. [2004]

An EEG should be performed only to support a diagnosis of epilepsy in adults in whom the clinical history suggests that the seizure is likely to be epileptic in origin. [2004]

An EEG should be performed only to support a diagnosis of epilepsy in children and young people. If an EEG is considered necessary, it should

be performed after the second epileptic seizure but may, in certain circumstances, as evaluated by the specialist, be considered after a first epileptic seizure. [2004]

An EEG should not be performed in the case of probable syncope because of the possibility of a false-positive result. [2004]

The EEG should not be used to exclude a diagnosis of epilepsy in a child, young person or adult in whom the clinical presentation supports a diagnosis of a non-epileptic event. [2004]

The EEG should not be used in isolation to make a diagnosis of epilepsy. [2004]

An EEG may be used to help determine seizure type and epilepsy syndrome in children, young people and adults in whom epilepsy is suspected. This enables them to be given the correct prognosis. [2004]

In children, young people and adults presenting with a first unprovoked seizure, unequivocal epileptiform activity shown on EEG can be used to assess the risk of seizure recurrence. [2004]

For children, young people and adults in whom epilepsy is suspected, but who present diagnostic difficulties, specialist investigations should be available. [2004]

Repeated standard EEGs may be helpful when the diagnosis of the epilepsy or the syndrome is unclear. However, if the diagnosis has been established, repeat EEGs are not likely to be helpful. [2004]

Repeated standard EEGs should not be used in preference to sleep or sleep-deprived EEGs. [2004]

When a standard EEG has not contributed to diagnosis or classification, a sleep EEG should be performed. [2004]

In children and young people, a sleep EEG is best achieved through sleep deprivation or the use of melatonin. [2004, amended 2012]

Long-term video or ambulatory EEG may be used in the assessment of children, young people and adults who present diagnostic difficulties after clinical assessment and standard EEG. [2004]

Provocation by suggestion may be used in the evaluation of non-epileptic attack disorder. However, it has a limited role and may lead to false-positive results in some people. [2004]

Photic stimulation and hyperventilation should remain part of standard EEG assessment. The child, young person or adult and family and/or carer should be made aware that such activation procedures may induce a seizure and they have a right to refuse. [2004]

*The Guideline Development Group considered that 'soon' meant being seen within 4 weeks.

Neuroimaging

Neuroimaging should be used to identify structural abnormalities that cause certain epilepsies. [2004]

Magnetic resonance imaging (MRI) should be the imaging investigation of choice in children, young people and adults with epilepsy. [2004]

MRI is particularly important in those:

- Who develop epilepsy before the age of 2 years or in adulthood
- Who have any suggestion of a focal onset on history, examination or EEG (unless clear evidence of benign focal epilepsy)
- In whom seizures continue in spite of first-line medication. [2004]

Children, young people and adults requiring MRI should have the test performed soon.* [2004]

Neuroimaging should not be routinely requested when a diagnosis of idiopathic generalised epilepsy has been made. [2004]

Computed tomography (CT) should be used to identify underlying gross pathology if MRI is not available or is contraindicated, and for children or young people in whom a general anaesthetic or sedation would be required for MRI but not CT. [2004]

In an acute situation, CT may be used to determine whether a seizure has been caused by an acute neurological lesion or illness. [2004]

*The GDG considered that 'soon' meant being seen within 4 weeks.

Other Tests

Measurement of serum prolactin is not recommended for the diagnosis of epilepsy. [2004]

In adults, appropriate blood tests (for example, plasma electrolytes, glucose, calcium) to identify potential causes and/or to identify any significant comorbidity should be considered. [2004]

In children and young people, other investigations, including blood and urine biochemistry, should be undertaken at the discretion of the specialist to exclude other diagnoses, and to determine an underlying cause of the epilepsy. [2004]

A 12-lead electrocardiogram (ECG) should be performed in adults with suspected epilepsy. [2004]

In children and young people, a 12-lead ECG should be considered in cases of diagnostic uncertainty. [2004]

In cases of diagnostic uncertainty, a referral to a cardiologist should be considered. [2004]

Neuropsychological Assessment

Neuropsychological assessment should be considered in children, young people and adults in whom it is important to evaluate learning disabilities and cognitive dysfunction, particularly in regard to language and memory. [2004]

Referral for a neuropsychological assessment is indicated:

- When a child, young person or adult with epilepsy is having educational or occupational difficulties
- When an MRI has identified abnormalities in cognitively important brain regions
- When a child, young person or adult complains of memory or other cognitive deficits and/or cognitive decline [2004]

Classification

Epileptic seizures and epilepsy syndromes in children, young people and adults should be classified using a multi-axial diagnostic scheme. The axes that should be considered are: description of seizure (ictal phenomenology); seizure type; syndrome and aetiology. [2004]

The seizure type(s) and epilepsy syndrome, aetiology, and co-morbidity should be determined, because failure to classify the epilepsy syndrome correctly can lead to inappropriate treatment and persistence of seizures. [2004]

Children, young people and adults with epilepsy should be given information about their seizure type(s) and epilepsy syndrome, and the likely prognosis. [2004]

Management

Children, young people and adults with epilepsy should have an accessible point of contact with specialist services. [2004]

All children, young people and adults with epilepsy should have a comprehensive care plan that is agreed between the person, family and/or carers where appropriate, and primary care and secondary care providers. This should include lifestyle issues as well as medical issues. [2004]

Epilepsy specialist nurses (ESNs) should be an integral part of the network of care of children, young people and adults with epilepsy. The key roles of the ESNs are to support both epilepsy specialists and generalists, to ensure access to community and multi-agency services and to provide information, training and support to the child, young person or adult, families, carers and, in the case of children, others involved in the child's education, welfare and wellbeing. [2004]

Healthcare professionals have a responsibility to educate others about epilepsy so as to reduce the stigma associated with it. They should provide information about epilepsy to all people who come into contact with children, young people and adults with epilepsy, including school staff, social care professionals and others. [2004]

Pharmacological Treatment

Note: See Appendix E of the original guideline document for further details of pharmacological treatment.

The GDG is aware of the contraindications to prescribing carbamazepine to some people of Han Chinese or Thai origin. Recommendations in this section offer alternatives, and so no specific recommendations are made for these groups.

The GDG is also aware of specific issues with prescribing sodium valproate to girls and women of childbearing age. Recommendations in this section offer alternative prescribing options for this group. Recommendations in the sections 'General Information About Pharmacological Treatment,' 'Continuation of Pharmacological Treatment' and 'Information and Advice for Women and Girls with Epilepsy' below also provide additional specific information of relevance when considering prescribing antiepileptic drugs (AEDs) to women of childbearing age.

NICE has also issued guidance on the use of retigabine as an option for the adjunctive treatment of partial (the term focal has been used in this guideline) onset seizures with or without secondary generalisation in adults aged 18 years and older with epilepsy in Retigabine for the adjunctive treatment of partial onset seizures in epilepsy (NICE technology appraisal guidance 232).

General Information About Pharmacological Treatment

Information that is provided about AEDs needs to be in the context of that provided by the manufacturer, for example, indications, side effects and licence status. [2004]

The AED treatment strategy should be individualised according to the seizure type, epilepsy syndrome, co-medication and co-morbidity, the child, young person or adult's lifestyle, and the preferences of the person and their family and/or carers as appropriate (see Appendix E in the original guideline document). [2004]

The diagnosis of epilepsy needs to be critically evaluated if events continue despite an optimal dose of a first-line AED. [2004]

Consistent supply to the child, young person or adult with epilepsy of a particular manufacturer's AED preparation is recommended, unless the prescriber, in consultation with the child, young person, adult and their family and/or carers as appropriate, considers that this is not a concern. Different preparations of some AEDs may vary in bioavailability or pharmacokinetic profiles and care needs to be taken to avoid reduced effect or excessive side effects. Consult the summary of product characteristics (SPC) and 'British national formulary' (BNF; available at http://bnf.org) on the bioavailability and pharmacokinetic profiles of individual AEDs, but note that these do not give information on comparing bioavailability of different generic preparations*. [new 2012]

It is recommended that children, young people and adults should be treated with a single AED (monotherapy) wherever possible. If the initial treatment is unsuccessful, then monotherapy using another drug can be tried. Caution is needed during the changeover period. [2004]

If an AED has failed because of adverse effects or continued seizures, a second drug should be started (which may be an alternative first-line or second-line drug) and built up to an adequate or maximum tolerated dose and then the first drug should be tapered off slowly. [2004]

If the second drug is unhelpful, either the first or second drug may be tapered, depending on relative efficacy, side effects and how well the drugs are tolerated before starting another drug. [2004]

It is recommended that combination therapy (adjunctive or 'add-on' therapy) should only be considered when attempts at monotherapy with AEDs have not resulted in seizure freedom. If trials of combination therapy do not bring about worthwhile benefits, treatment should revert to the regimen (monotherapy or combination therapy) that has proved most acceptable to the child, young person or adult, in terms of providing the best balance between effectiveness in reducing seizure frequency and tolerability of side effects. [2004]

If using carbamazepine, offer controlled-release carbamazepine preparations. [new 2012]

When prescribing sodium valproate to women and girls of present and future childbearing potential, discuss the possible risk of malformation and neurodevelopmental impairments in an unborn child, particularly with high doses of this AED or when using as part of polytherapy. [new 2012]

*Recommendations in the sections 'Principal of Decision Making,' 'Coping With Epilepsy' and 'Information' above describe the principles of decision making and best practice in relation to effective and appropriate consultation between healthcare professionals and children, young people and adults with epilepsy.

Initiation of Pharmacological Treatment

AED therapy should only be started once the diagnosis of epilepsy is confirmed, except in exceptional circumstances that require discussion and agreement between the prescriber, the specialist and the child, young person or adult and their family and/or carers as appropriate. [2004]

AED therapy should be initiated in adults on the recommendation of a specialist. [2004]

AED therapy in children and young people should be initiated by a specialist. [2004]

The decision to initiate AED therapy should be taken between the child, young person or adult, their family and/or carers (as appropriate) and the specialist after a full discussion of the risks and benefits of treatment. This discussion should take into account details of the person's epilepsy syndrome, prognosis and lifestyle. [2004]

Treatment with AED therapy is generally recommended after a second epileptic seizure. [2004]

When possible, choose which AED to offer on the basis of the presenting epilepsy syndrome. If the epilepsy syndrome is not clear at presentation, base the decision on the presenting seizure type(s). [new 2012]

AED therapy should be considered and discussed with children, young people and adults and their family and/or carers as appropriate after a first unprovoked seizure if:

- The child, young person or adult has a neurological deficit
- The EEG shows unequivocal epileptic activity
- The child, young person or adult and/or their family and/or carers consider the risk of having a further seizure unacceptable
- Brain imaging shows a structural abnormality [2004]

It should be recognised that some children, young people and adults (through their families and/or carers, in some instances) may choose not to take AED therapy following a full discussion of the risks and benefits. [2004]

Pharmacological Treatment of Focal Seizures

First-Line Treatment in Children, Young People and Adults with Newly Diagnosed Focal Seizures

Offer carbamazepine or lamotrigine as first-line treatment to children, young people and adults with newly diagnosed focal seizures. [new 2012]

Levetiracetam is not cost effective at June 2011 unit costs*. Offer levetiracetam, oxcarbazepine or sodium valproate (provided the acquisition cost of levetiracetam falls to at least 50% of June 2011 value documented in the National Health Service Drug Tariff for England and Wales) if carbamazepine and lamotrigine are unsuitable or not tolerated. If the first AED tried is ineffective, offer an alternative from these five AEDs. Be aware of the teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Consider adjunctive treatment if a second well-tolerated AED is ineffective (see the two preceding recommendations). [new 2012]

*Estimated cost of a 1500 mg daily dose was £2.74 at June 2011. Cost taken from the National Health Service Drug Tariff for England and Wales, available at www.ppa.org.uk/ppa/edt_intro.htm.

Adjunctive Treatment in Children, Young People and Adults with Refractory Focal Seizures

Offer carbamazepine, clobazam*, gabapentin*, lamotrigine, levetiracetam, oxcarbazepine, sodium valproate or topiramate as adjunctive treatment to children, young people and adults with focal seizures if first-line treatments (see the recommendations in the section 'First-Line Treatment in Children, Young People and Adults With Newly Diagnosed Focal Seizures' above) are ineffective or not tolerated. Be aware of teratogenic risks of sodium valproate (see the recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

If adjunctive treatment (see the recommendation above) is ineffective or not tolerated, discuss with, or refer to, a tertiary epilepsy specialist. Other AEDs that may be considered by the tertiary epilepsy specialist are eslicarbazepine acetate*, lacosamide, phenobarbital, phenytoin, pregabalin*, tiagabine, vigabatrin and zonisamide*. Carefully consider the risk–benefit ratio when using vigabatrin because of the risk of an irreversible effect on visual fields. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Newly Diagnosed Generalised Tonic–Clonic (GTC) Seizures

First-Line Treatment in Children, Young People and Adults with Newly Diagnosed GTC Seizures

Offer sodium valproate as first-line treatment to children, young people and adults with newly diagnosed GTC seizures. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Offer lamotrigine if sodium valproate is unsuitable. If the person has myoclonic seizures or is suspected of having juvenile myoclonic epilepsy (JME), be aware that lamotrigine may exacerbate myoclonic seizures. [new 2012]

Consider carbamazepine and oxcarbazepine* but be aware of the risk of exacerbating myoclonic or absence seizures. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Adjunctive Treatment in Children, Young People and Adults with GTC Seizures

Offer clobazam*, lamotrigine, levetiracetam, sodium valproate or topiramate as adjunctive treatment to children, young people and adults with GTC seizures if first-line treatments (see the recommendations in the section 'First-Line Treatment in Children, Young People and Adults With

Newly Diagnosed GTC Seizures' above) are ineffective or not tolerated. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

If there are absence or myoclonic seizures, or if JME is suspected, do not offer carbamazepine, gabapentin, oxcarbazepine, phenytoin, pregabalin, tiagabine or vigabatrin. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Absence Seizures

First-Line Treatment in Children, Young People and Adults with Absence Seizures

Offer ethosuximide or sodium valproate as first-line treatment to children, young people and adults with absence seizures. If there is a high risk of GTC seizures, offer sodium valproate first, unless it is unsuitable. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Offer lamotrigine* if ethosuximide and sodium valproate are unsuitable, ineffective or not tolerated. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Adjunctive Treatment in Children, Young People and Adults with Absence Seizures

If two first-line AEDs (see the two preceding recommendations) are ineffective in children, young people and adults with absence seizures, consider a combination of two of these three AEDs as adjunctive treatment: ethosuximide, lamotrigine* or sodium valproate. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

If adjunctive treatment (see the preceding recommendation) is ineffective or not tolerated, discuss with, or refer to, a tertiary epilepsy specialist and consider clobazam*, clonazepam, levetiracetam*, topiramate* or zonisamide*. [new 2012]

Do not offer carbamazepine, gabapentin, oxcarbazepine, phenytoin, pregabalin, tiagabine or vigabatrin. [new 2012]

Pharmacological Treatment of Myoclonic Seizures

First-Line Treatment in Children, Young People and Adults with Myoclonic Seizures

Offer sodium valproate as first-line treatment to children, young people and adults with newly diagnosed myoclonic seizures, unless it is unsuitable. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Consider levetiracetam* or topiramate* if sodium valproate is unsuitable or not tolerated. Be aware that topiramate has a less favourable side-effect profile than levetiracetam and sodium valproate. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Adjunctive Treatment in Children, Young People and Adults with Myoclonic Seizures

Offer levetiracetam, sodium valproate or topiramate* as adjunctive treatment to children, young people and adults with myoclonic seizures if first-line treatments (see the two preceding recommendations) are ineffective or not tolerated. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

If adjunctive treatment (see the preceding recommendation) is ineffective or not tolerated, discuss with, or refer to, a tertiary epilepsy specialist and consider clobazam*, clonazepam, piracetam or zonisamide*. [new 2012]

Do not offer carbamazepine, gabapentin, oxcarbazepine, phenytoin, pregabalin, tiagabine or vigabatrin. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Tonic or Atonic Seizures

First-Line Treatment in Children, Young People and Adults with Tonic or Atonic Seizures

Offer sodium valproate as first-line treatment to children, young people and adults with tonic or atonic seizures. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Adjunctive Treatment in Children, Young People and Adults with Tonic or Atonic Seizures

Offer lamotrigine* as adjunctive treatment to children, young people and adults with tonic or atonic seizures if first-line treatment with sodium valproate is ineffective or not tolerated. [new 2012]

Discuss with a tertiary epilepsy specialist if adjunctive treatment (see the preceding recommendation) is ineffective or not tolerated. Other AEDs that may be considered by the tertiary epilepsy specialist are rufinamide* and topiramate*. [new 2012]

Do not offer carbamazepine, gabapentin, oxcarbazepine, pregabalin, tiagabine or vigabatrin. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Infantile Spasms

First-Line Treatment in Infants with Infantile Spasms

Discuss with, or refer to, a tertiary paediatric epilepsy specialist when an infant presents with infantile spasms. [new 2012]

Offer a steroid (prednisolone or tetracosactide*) or vigabatrin as first-line treatment to infants with infantile spasms that are not due to tuberous sclerosis. Carefully consider the risk–benefit ratio when using vigabatrin or steroids. [new 2012]

Offer vigabatrin as first-line treatment to infants with infantile spasms due to tuberous sclerosis. If vigabatrin is ineffective, offer a steroid (prednisolone or tetracosactide*). Carefully consider the risk–benefit ratio when using vigabatrin or steroids. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Dravet Syndrome

First-Line Treatment in Children with Dravet Syndrome

Discuss with, or refer to, a tertiary paediatric epilepsy specialist when a child presents with suspected Dravet syndrome. [new 2012]

Consider sodium valproate or topiramate* as first-line treatment in children with Dravet syndrome. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Adjunctive Treatment in Children, Young People and Adults with Dravet Syndrome

Discuss with a tertiary epilepsy specialist if first-line treatments (see the preceding recommendation) in children, young people and adults with Dravet syndrome are ineffective or not tolerated, and consider clobazam* or stiripentol as adjunctive treatment. [new 2012]

Do not offer carbamazepine, gabapentin, lamotrigine, oxcarbazepine, phenytoin, pregabalin, tiagabine or vigabatrin. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Lennox–Gastaut Syndrome

First-Line Treatment in Children with Lennox–Gastaut Syndrome

Discuss with, or refer to, a tertiary paediatric epilepsy specialist when a child presents with suspected Lennox–Gastaut syndrome. [new 2012]

Offer sodium valproate as first-line treatment to children with Lennox–Gastaut syndrome. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Adjunctive Treatment in Children, Young People and Adults with Lennox–Gastaut Syndrome

Offer lamotrigine as adjunctive treatment to children, young people and adults with Lennox–Gastaut syndrome if first-line treatment with sodium valproate is ineffective or not tolerated. [new 2012]

Discuss with a tertiary epilepsy specialist if adjunctive treatment (see the preceding recommendation) is ineffective or not tolerated. Other AEDs

that may be considered by the tertiary epilepsy specialist are rufinamide and topiramate. [new 2012]

Do not offer carbamazepine, gabapentin, oxcarbazepine, pregabalin, tiagabine or vigabatrin. [new 2012]

Only offer felbamate* in centres providing tertiary epilepsy specialist care and when treatment with all of the AEDs listed in the first two recommendations has proved ineffective or not tolerated. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Benign Epilepsy with Centrotemporal Spikes, Panayiotopoulos Syndrome or Late-Onset Childhood Occipital Epilepsy (Gastaut Type)

First-line Treatment in Children and Young People with Benign Epilepsy with Centrotemporal Spikes, Panayiotopoulos Syndrome or Late-Onset Childhood Occipital Epilepsy (Gastaut Type)

Discuss with the child or young person, and their family and/or carers, whether AED treatment for benign epilepsy with centrotemporal spikes, Panayiotopoulos syndrome or late-onset childhood occipital epilepsy (Gastaut type) is indicated. [new 2012]

Offer carbamazepine* or lamotrigine* as first-line treatment to children and young people with benign epilepsy with centrotemporal spikes, Panayiotopoulos syndrome or late-onset childhood occipital epilepsy (Gastaut type). [new 2012]

Levetiracetam is not cost effective at June 2011 unit costs.** Offer levetiracetam*, oxcarbazepine* or sodium valproate (provided the acquisition cost of levetiracetam falls to at least 50% of June 2011 value documented in the National Health Service Drug Tariff for England and Wales) if carbamazepine and lamotrigine are unsuitable or not tolerated. If the first AED tried is ineffective, offer an alternative from these five AEDs. Be aware that carbamazepine and oxcarbazepine may exacerbate or unmask continuous spike and wave during slow sleep, which may occur in some children with benign epilepsy with centrotemporal spikes. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Consider adjunctive treatment if a second well-tolerated AED is ineffective (see the two preceding recommendations). [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.
**Estimated cost of a 1500 mg daily dose was £2.74 at June 2011. Cost taken from the National Health Service Drug Tariff for England and Wales, available at www.ppa.org.uk/ppa/edt_intro.htm.

Adjunctive Treatment in Children and Young People with Benign Epilepsy with Centrotemporal Spikes, Panayiotopoulos Syndrome or Late-Onset Childhood Occipital Epilepsy (Gastaut Type)

Offer carbamazepine*, clobazam*, gabapentin*, lamotrigine*, levetiracetam*, oxcarbazepine*, sodium valproate or topiramate* as adjunctive treatment to children and young people with benign epilepsy with centrotemporal spikes, Panayiotopoulos syndrome or late-onset childhood occipital epilepsy (Gastaut type) if first-line treatments (see the recommendations in the preceding section>) are ineffective or not tolerated. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

If adjunctive treatment (see the preceding recommendation) is ineffective or not tolerated, discuss with, or refer to, a tertiary epilepsy specialist. Other AEDs that may be considered by the tertiary epilepsy specialist are eslicarbazepine acetate*, lacosamide*, phenobarbital, phenytoin, pregabalin*, tiagabine*, vigabatrin* and zonisamide*. Carefully consider the risk–benefit ratio when using vigabatrin because of the risk of an irreversible effect on visual fields. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Idiopathic Generalised Epilepsy (IGE)

First-Line Treatment in Children, Young People and Adults with IGE

Offer sodium valproate as first-line treatment to children, young people and adults with newly diagnosed IGE, particularly if there is a photoparoxysmal response on EEG. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Offer lamotrigine* if sodium valproate is unsuitable or not tolerated. Be aware that lamotrigine can exacerbate myoclonic seizures. If JME is suspected see the recommendations in the section 'First-Line Treatment in Children, Young People and Adults with JME' below. [new 2012]

Consider topiramate* but be aware that it has a less favourable side-effect profile than sodium valproate and lamotrigine*. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Adjunctive Treatment in Children, Young People and Adults with IGE

Offer lamotrigine*, levetiracetam*, sodium valproate or topiramate* as adjunctive treatment to children, young people and adults with IGE if first-line treatments (see the recommendations in the preceding section) are ineffective or not tolerated. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

If adjunctive treatment (see the preceding recommendation) is ineffective or not tolerated, discuss with, or refer to, a tertiary epilepsy specialist and consider clobazam*, clonazepam or zonisamide*. [new 2012]

Do not offer carbamazepine, gabapentin, oxcarbazepine, phenytoin, pregabalin, tiagabine or vigabatrin. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of JME

First-line Treatment in Children, Young People and Adults with JME

Offer sodium valproate as first-line treatment to children, young people and adults with newly diagnosed JME, unless it is unsuitable. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Consider lamotrigine*, levetiracetam* or topiramate* if sodium valproate is unsuitable or not tolerated. Be aware that topiramate has a less favourable side-effect profile than lamotrigine, levetiracetam and sodium valproate, and that lamotrigine may exacerbate myoclonic seizures. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Adjunctive Treatment in Children, Young People and Adults with JME

Offer lamotrigine*, levetiracetam, sodium valproate or topiramate* as adjunctive treatment to children, young people and adults with JME if first-line treatments (see the recommendations in the preceding section) are ineffective or not tolerated. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

If adjunctive treatment (see the preceding recommendation) is ineffective or not tolerated, discuss with, or refer to, a tertiary epilepsy specialist and consider clobazam*, clonazepam or zonisamide*. [new 2012]

Do not offer carbamazepine, gabapentin, oxcarbazepine, phenytoin, pregabalin, tiagabine or vigabatrin. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Epilepsy with GTC Seizures Only

First-Line Treatment in Children, Young People and Adults with Epilepsy with GTC Seizures Only

Offer lamotrigine or sodium valproate as first-line treatment to children, young people and adults with epilepsy with GTC seizures only. If they have suspected myoclonic seizures, or are suspected of having JME, offer sodium valproate first, unless it is unsuitable. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Consider carbamazepine and oxcarbazepine* but be aware of the risk of exacerbating myoclonic or absence seizures. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Adjunctive Treatment in Children, Young People and Adults With Epilepsy With GTC Seizures Only

Offer clobazam* lamotrigine, levetiracetam, sodium valproate or topiramate as adjunctive treatment to children, young people and adults with epilepsy with GTC seizures only, if first-line treatments (see the recommendations for first-line treatment above) are ineffective or not tolerated. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological

Treatment' above). [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Pharmacological Treatment of Childhood Absence Epilepsy, Juvenile Absence Epilepsy or Other Absence Epilepsy Syndromes

First-Line Treatment in Children, Young People and Adults with Childhood Absence Epilepsy, Juvenile Absence Epilepsy or Other Absence Epilepsy Syndromes

Offer ethosuximide or sodium valproate as first-line treatment to children, young people and adults with absence syndromes. If there is a high risk of GTC seizures, offer sodium valproate first, unless it is unsuitable. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

Offer lamotrigine* if ethosuximide and sodium valproate are unsuitable, ineffective or not tolerated. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Adjunctive Treatment in Children, Young People and Adults with Childhood Absence Epilepsy, Juvenile Absence Epilepsy or Other Absence Epilepsy Syndromes

If two first-line AEDs (see the recommendations for first-line treatment above) are ineffective in children, young people and adults with absence epilepsy syndromes, consider a combination of two of these three AEDs as adjunctive treatment: ethosuximide, lamotrigine* or sodium valproate. Be aware of teratogenic risks of sodium valproate (see the related recommendation in the section 'General Information About Pharmacological Treatment' above). [new 2012]

If adjunctive treatment (see the preceding recommendation) is ineffective or not tolerated, discuss with, or refer to, a tertiary epilepsy specialist and consider clobazam*, clonazepam, levetiracetam*, topiramate* or zonisamide*. [new 2012]

Do not offer carbamazepine, gabapentin, oxcarbazepine, phenytoin, pregabalin, tiagabine or vigabatrin. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented.

Other Epilepsy Syndromes

Refer to a tertiary paediatric epilepsy specialist all children and young people with continuous spike and wave during slow sleep, Landau–Kleffner syndrome or myoclonic-astatic epilepsy. [new 2012]

Continuation of Pharmacological Treatment

Maintain a high level of vigilance for treatment-emergent adverse effects (for example, bone health issues and neuropsychiatric issues*). [new 2012]

Continuing AED therapy should be planned by the specialist. It should be part of the child, young person or adult's agreed treatment plan, which should include details of how specific drug choices were made, drug dosage, possible side effects, and action to take if seizures persist. [2004]

The needs of the child, young person or adult and their family and/or carers as appropriate should be taken into account when healthcare professionals take on the responsibility of continuing prescribing. [2004]

If management is straightforward, continuing AED therapy can be prescribed in primary care if local circumstances and/or licensing allow. [2004]

The prescriber must ensure that the child, young person or adult and their family and/or carers as appropriate are fully informed about treatment including action to be taken after a missed dose or after a gastrointestinal upset. [2004]

Adherence to treatment can be optimised with the following:

- Educating children, young people and adults and their families and/or carers in the understanding of their condition and the rationale of treatment
- Reducing the stigma associated with the condition (see also the section 'Coping with Epilepsy' above)
- Using simple medication regimens
- Positive relationships between healthcare professionals, the child, young person or adult with epilepsy and their family and/or carers. [2004]

Regular blood test monitoring in adults is not recommended as routine, and should be done only if clinically indicated. [2004]

Regular blood test monitoring in children and young people is not recommended as routine, and should be done only if clinically indicated and recommended by the specialist. [2004]

Indications for monitoring of AED blood levels are:

- Detection of non-adherence to the prescribed medication
- Suspected toxicity
- Adjustment of phenytoin dose
- Management of pharmacokinetic interactions (for example, changes in bioavailability, changes in elimination, and co-medication with interacting drugs)
- Specific clinical conditions, for example, status epilepticus, organ failure and certain situations in pregnancy (see the related recommendation in the section 'Pregnancy' below) [2012]

Examples of blood tests include:

- Before surgery – clotting studies in those on sodium valproate
- Full blood count, electrolytes, liver enzymes, vitamin D levels, and other tests of bone metabolism (for example, serum calcium and alkaline phosphatase) every 2–5 years for adults taking enzyme-inducing drugs [2004]

Asymptomatic minor abnormalities in test results are not necessarily an indication for changes in medication. [2004]

*Treatment with AEDs is associated with a small risk of suicidal thoughts and behaviour; available data suggest that the increased risk applies to all AEDs and may be seen as early as 1 week after starting treatment. Available from: www.mhra.gov.uk/PrintPreview/DefaultSplashPP/CON019574?DynamicListQuery=&DynamicListSortBy=xCreationDate&DynamicListSortOrder=Desc&Dyna.

Withdrawal of Pharmacological Treatment

The decision to continue or withdraw medication should be taken by the child, young person or adult, their family and/or carers as appropriate, and the specialist after a full discussion of the risks and benefits of withdrawal. At the end of the discussion children, young people and adults, and their family and/or carers as appropriate, should understand their risk of seizure recurrence on and off treatment. This discussion should take into account details of the child, young person or adult's epilepsy syndrome, prognosis and lifestyle. [2004]

Withdrawal of AEDs must be managed by, or be under the guidance of, the specialist. [2004]

The risks and benefits of continuing or withdrawing AED therapy should be discussed with children, young people and adults, and their families and/or carers as appropriate, who have been seizure free for at least 2 years (see Appendix H* of the full version of the original guideline document). [2004]

When AED treatment is being discontinued in a child, young person or adult who has been seizure free, it should be carried out slowly (at least 2–3 months) and one drug should be withdrawn at a time. [2004]

Particular care should be taken when withdrawing benzodiazepines and barbiturates (may take up to 6 months or longer) because of the possibility of drug-related withdrawal symptoms and/or seizure recurrence. [2004]

There should be a failsafe plan agreed with children, young people and adults and their families and/or carers as appropriate, whereby if seizures recur, the last dose reduction is reversed and medical advice is sought. [2004]

*Appendix H of the full guideline provides tables for the prognosis for remission of seizures in adults.

Referral for Complex or Refractory Epilepsy

All children, young people and adults with epilepsy should have access via their specialist to a tertiary service when circumstances require. [2004]

If seizures are not controlled and/or there is diagnostic uncertainty or treatment failure, children, young people and adults should be referred to tertiary services soon* for further assessment. Referral should be considered when one or more of the following criteria are present:

- The epilepsy is not controlled with medication within 2 years.
- Management is unsuccessful after two drugs.
- The child is aged under 2 years.
- A child, young person or adult experiences, or is at risk of, unacceptable side effects from medication.

- There is a unilateral structural lesion.
- There is psychological and/or psychiatric co-morbidity.
- There is diagnostic doubt as to the nature of the seizures and/or seizure syndrome. [2004]

In children, the diagnosis and management of epilepsy within the first few years of life may be extremely challenging. For this reason, children with suspected epilepsy should be referred to tertiary services early, because of the profound developmental, behavioural and psychological effects that may be associated with continuing seizures. [2004]

Behavioural or developmental regression or inability to identify the epilepsy syndrome in a child, young person or adult should result in immediate referral to tertiary services. [2004]

Children, young people and adults with specific syndromes such as Sturge–Weber syndrome, the hemispheric syndromes, Rasmussen's encephalitis and hypothalamic hamartoma should be referred to a tertiary epilepsy service. [2004]

Psychiatric co-morbidity and/or negative baseline investigations should not be a contraindication for referral to a tertiary service.** [2004]

The tertiary service should include a multidisciplinary team, experienced in the assessment of children, young people and adults with complex epilepsy, and have adequate access to investigations and treatment by both medical and surgical means. [2004]

The expertise of multidisciplinary teams involved in managing complex epilepsy should include psychology, psychiatry, social work, occupational therapy, counselling, neuroradiology, clinical nurse specialists, neurophysiology, neurology, neurosurgery and neuroanaesthesia. Teams should have MRI and video telemetry facilities available to them. [2004]

The neurosurgeon in the multidisciplinary team should have specialist experience of and/or training in epilepsy surgery and have access to invasive EEG recording facilities. [2004]

Information should be provided to children, young people and adults and families and/or carers as appropriate about the reasons for considering surgery. The benefits and risks of the surgical procedure under consideration should be fully explained before informed consent is obtained. [2004]

*The Guideline Development Group considered that 'soon' meant being seen within 4 weeks.

**In this recommendation, 'centre' has been replaced with 'service' for consistency across recommendations.

Psychological Interventions

Psychological interventions (relaxation, cognitive behaviour therapy, biofeedback) may be used in conjunction with AED therapy in adults where either the person or the specialist considers seizure control to be inadequate with optimal AED therapy. This approach may be associated with an improved quality of life in some people. [2004]

Psychological interventions (relaxation, cognitive behaviour therapy) may be used in children and young people with drug-resistant focal epilepsy. [2004]

Psychological interventions may be used as adjunctive therapy. They have not been proven to affect seizure frequency and are not an alternative to pharmacological treatment. [2004]

Ketogenic Diet

Refer children and young people with epilepsy whose seizures have not responded to appropriate AEDs to a tertiary paediatric epilepsy specialist for consideration of the use of a ketogenic diet. [new 2012]

Vagus Nerve Stimulation (VNS)

Vagus nerve stimulation is indicated for use as an adjunctive therapy in reducing the frequency of seizures in adults who are refractory to antiepileptic medication but who are not suitable for resective surgery. This includes adults whose epileptic disorder is dominated by focal seizures* (with or without secondary generalisation) or generalised seizures. [2004, amended 2012]

Vagus nerve stimulation is indicated for use as an adjunctive therapy in reducing the frequency of seizures in children and young people who are refractory to antiepileptic medication but who are not suitable for resective surgery. This includes children and young people whose epileptic disorder is dominated by focal seizures* (with or without secondary generalisation) or generalised seizures**. [2004, amended 2012]

*In this recommendation, 'partial seizures' has been replaced with 'focal seizures' to reflect a change in terminology since the original guideline was published in 2004.

**Evidence from 'Vagus nerve stimulation for refractory epilepsy in children', NICE interventional procedure guidance 50 (2004).

Prolonged or Repeated Seizures and Convulsive Status Epilepticus

First-Line Treatment for Children, Young People and Adults with Prolonged or Repeated Generalised, Convulsive (Tonic–Clonic, Tonic or Clonic) Seizures in the Community

Give immediate emergency care and treatment to children, young people and adults who have prolonged (lasting 5 minutes or more) or repeated (three or more in an hour) convulsive seizures in the community. [2012]

Only prescribe buccal midazolam or rectal diazepam* for use in the community for children, young people and adults who have had a previous episode of prolonged or serial convulsive seizures. [new 2012]

Administer buccal midazolam as first-line treatment in children, young people and adults with prolonged or repeated seizures in the community. Administer rectal diazepam* if preferred or if buccal midazolam is not available. If intravenous access is already established and resuscitation facilities are available, administer intravenous lorazepam. [new 2012]

Treatment should be administered by trained clinical personnel or, if specified by an individually agreed protocol drawn up with the specialist, by family members or carers with appropriate training. [2004]

Care must be taken to secure the child, young person or adult's airway and assess his or her respiratory and cardiac function. [2004]

Depending on response to treatment, the person's situation and any personalised care plan, call an ambulance, particularly if:

- The seizure is continuing 5 minutes after the emergency medication has been administered
- The person has a history of frequent episodes of serial seizures or has convulsive status epilepticus, or this is the first episode requiring emergency treatment or
- There are concerns or difficulties monitoring the person's airway, breathing, circulation or other vital signs. [new 2012]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E in the original guideline document for details). Informed consent should be obtained and documented in line with normal standards in emergency care.

Treatment for Children, Young People and Adults with Convulsive Status Epilepticus in Hospital

Convulsive Status Epilepticus

For children, young people and adults with ongoing generalised tonic–clonic seizures (convulsive status epilepticus) who are in hospital, immediately:

- Secure airway
- Give high-concentration oxygen
- Assess cardiac and respiratory function
- Check blood glucose levels and
- Secure intravenous access in a large vein

See also the suggested protocols in Appendix F of the full guideline document. [new 2012]

Administer intravenous lorazepam as first-line treatment in hospital in children, young people and adults with ongoing generalised tonic–clonic seizures (convulsive status epilepticus). Administer intravenous diazepam if intravenous lorazepam is unavailable, or buccal midazolam if unable to secure immediate intravenous access. Administer a maximum of two doses of the first-line treatment (including pre-hospital treatment). See also the suggested protocols in Appendix F of the original guideline document. [new 2012]

If seizures continue, administer intravenous phenobarbital or phenytoin as second-line treatment in hospital in children, young people and adults with ongoing GTC seizures (convulsive status epilepticus). See also the suggested protocols in Appendix F of the original guideline document. [new 2012]

Refractory Convulsive Status Epilepticus

Follow the suggested protocols in Appendix F of the original guideline document for treating refractory convulsive status epilepticus in secondary care. [2012]

Administer intravenous midazolam*, propofol* or thiopental sodium* to treat adults with refractory convulsive status epilepticus. Adequate monitoring, including blood levels of AEDs, and critical life systems support are required. See also the suggested protocols in Appendix F of the full guideline document. [new 2012]

Administer intravenous midazolam* or thiopental sodium* to treat children and young people with refractory convulsive status epilepticus. Adequate monitoring, including blood levels of AEDs, and critical life systems support are required. See also the suggested protocols in Appendix F of the original guideline document. [2012]

As the treatment pathway progresses, the expertise of an anaesthetist/intensivist should be sought. [2004]

If either the whole protocol or intensive care is required the tertiary service should be consulted. [2004]

Regular AEDs should be continued at optimal doses and the reasons for status epilepticus should be investigated. [2004]

An individual treatment pathway should be formulated for children, young people and adults who have recurrent convulsive status epilepticus. [2004]

*At the time of publication (January 2012), this drug did not have UK marketing authorisation for this indication and/or population (see Appendix E of the original guideline document for details). Informed consent should be obtained and documented in line with normal standards in emergency care.

Non-Convulsive Status Epilepticus

Non-convulsive status epilepticus is uncommon and management is less urgent. A suggested guideline can be found in Appendix F of the full guideline document. [2004]

Women and Girls with Epilepsy

Information and Advice for Women and Girls with Epilepsy

In order to enable informed decisions and choice, and to reduce misunderstandings, women and girls with epilepsy and their partners, as appropriate, must be given accurate information and counselling about contraception, conception, pregnancy, caring for children and breastfeeding, and menopause. [2004]

Information about contraception, conception, pregnancy, or menopause should be given to women and girls in advance of sexual activity, pregnancy or menopause, and the information should be tailored to their individual needs. This information should also be given, as needed, to people who are closely involved with women and girls with epilepsy. These may include her family and/or carers. [2004]

All healthcare professionals who treat, care for, or support women and girls with epilepsy should be familiar with relevant information and the availability of counselling. [2004]

Discuss with women and girls of childbearing potential (including young girls who are likely to need treatment into their childbearing years), and their parents and/or carers if appropriate, the risk of AEDs causing malformations and possible neurodevelopmental impairments in an unborn child. Assess the risks and benefits of treatment with individual drugs. There are limited data on risks to the unborn child associated with newer drugs. Specifically discuss the risk of continued use of sodium valproate to the unborn child, being aware that higher doses of sodium valproate (more than 800 mg/day) and polytherapy, particularly with sodium valproate, are associated with greater risk. [new 2012]

Be aware of the latest data on the risks to the unborn child associated with AED therapy when prescribing for women and girls of present and future childbearing potential. [2012]

All women and girls on AEDs should be offered 5 mg per day of folic acid before any possibility of pregnancy. [2004]

Refer to the SPC and BNF (available at http://bnf.org) for individual drug advice on the interactions between AEDs and hormonal replacement and contraception. [new 2012]

Contraception

In women of childbearing potential, the possibility of interaction with oral contraceptives should be discussed and an assessment made as to the risks and benefits of treatment with individual drugs. [2004]

In girls of childbearing potential, including young girls who are likely to need treatment into their childbearing years, the possibility of interaction with oral contraceptives should be discussed with the child and/or her carer, and an assessment made as to the risks and benefits of treatment with individual drugs. [2004]

In women and girls of childbearing potential, the risks and benefits of different contraceptive methods, including hormone-releasing intrauterine devices (IUDs), should be discussed. [2004]

If a woman or girl taking enzyme-inducing AEDs chooses to take the combined oral contraceptive pill, guidance about dosage should be sought

from the SPC and current edition of the BNF (available at http://bnf.org). [2004, amended 2012]

The progestogen*-only pill is not recommended as reliable contraception in women and girls taking enzyme-inducing AEDs. [2004, amended 2012]

The progestogen* implant is not recommended in women and girls taking enzyme-inducing AEDs. [2004, amended 2012]

The use of additional barrier methods should be discussed with women and girls taking enzyme-inducing AEDs and oral contraception or having depot injections of progestogen*. [2004, amended 2012]

If emergency contraception is required for women and girls taking enzyme-inducing AEDs, the type and dose of emergency contraception should be in line with the SPC and current edition of the BNF (available at http://bnf.org). [2004, amended 2012]

Discuss with women and girls who are taking lamotrigine that the simultaneous use of any oestrogen-based contraceptive can result in a significant reduction of lamotrigine levels and lead to loss of seizure control. When a woman or girl starts or stops taking these contraceptives, the dose of lamotrigine may need to be adjusted. [new 2012]

*In this recommendation, 'progesterone' has been replaced with 'progestogen' to reflect a change in terminology since the original NICE guideline was published in 2004.

Pregnancy

Women and girls with epilepsy need accurate information during pregnancy, and the possibility of status epilepticus and sudden death in epilepsy (SUDEP) should be discussed with all women and girls who plan to stop AED therapy (see the section 'Withdrawal of Pharmacologic Treatment' above). [2004]

All pregnant women and girls with epilepsy should be encouraged to notify their pregnancy, or allow their clinician to notify the pregnancy, to the UK Epilepsy and Pregnancy Register (www.epilepsyandpregnancy.co.uk). [2004]

The clinician should discuss with the woman and girl the relative benefits and risks of adjusting medication to enable her to make an informed decision. Where appropriate, the woman or girl's specialist should be consulted. [2004]

Women and girls with GTC seizures should be informed that the fetus may be at relatively higher risk of harm during a seizure, although the absolute risk remains very low, and the level of risk may depend on seizure frequency. [2004]

Women and girls should be reassured that there is no evidence that focal*, absence and myoclonic seizures affect the pregnancy or developing fetus adversely unless they fall and sustain an injury. [2004, amended 2012]

Women and girls should be reassured that an increase in seizure frequency is generally unlikely in pregnancy or in the first few months after birth. [2004]

Generally, women and girls may be reassured that the risk of a tonic–clonic seizure during the labour and the 24 hours after birth is low (1%–4%). [2004]

Women and girls with epilepsy should be informed that although they are likely to have healthy pregnancies, their risk of complications during pregnancy and labour is higher than for women and girls without epilepsy. [2004]

Care of pregnant women and girls should be shared between the obstetrician and the specialist. [2004]

Pregnant women and girls who are taking AEDs should be offered a high-resolution ultrasound scan to screen for structural anomalies. This scan should be performed at 18–20 weeks' gestation by an appropriately trained ultrasonographer, but earlier scanning may allow major malformations to be detected sooner. [2004]

The risk of seizures during labour is low, but it is sufficient to warrant the recommendation that delivery should take place in an obstetric unit with facilities for maternal and neonatal resuscitation and treating maternal seizures. [2004]

All children born to mothers taking enzyme-inducing AEDs should be given 1 mg of vitamin K parenterally at delivery. [2004]

Genetic counselling should be considered if one partner has epilepsy, particularly if the partner has idiopathic epilepsy and a positive family history of epilepsy. [2004]

Although there is an increased risk of seizures in children of parents with epilepsy, children, young people and adults with epilepsy should be given information that the probability that a child will be affected is generally low. However, this will depend on the family history. [2004]

Advanced planning, including the development of local protocols for care, should be implemented in obstetric units that deliver babies of women and girls with epilepsy. [2004]

Joint epilepsy and obstetric clinics may be convenient for mothers and healthcare professionals but there is insufficient evidence to recommend their routine use. [2004]

It is, however, important that there should be regular follow-up, planning of delivery, and liaison between the specialist or epilepsy team and the obstetrician or midwife. [2004]

Aim for seizure freedom before conception and during pregnancy (particularly for women and girls with GTC seizures) but consider the risk of adverse effects of AEDs and use the lowest effective dose of each AED, avoiding polytherapy if possible. [new 2012]

Do not routinely monitor AED levels during pregnancy. If seizures increase or are likely to increase, monitoring AED levels (particularly levels of lamotrigine and phenytoin, which may be particularly affected in pregnancy) may be useful when making dose adjustments. [new 2012]

* In this recommendation, 'partial seizures' has been replaced with 'focal seizures' to reflect a change in terminology since the original guideline was published in 2004.

Breastfeeding

All women and girls with epilepsy should be encouraged to breastfeed, except in very rare circumstances. Breastfeeding for most women and girls taking AEDs is generally safe and should be encouraged. However, each mother needs to be supported in the choice of feeding method that bests suits her and her family. [2004]

Prescribers should consult individual drug advice in the SPC and the BNF (available at http://bnf.org) when prescribing AEDs for women and girls who are breastfeeding. The decision regarding AED therapy and breastfeeding should be made between the woman or girl and the prescriber, and be based on the risks and benefits of breastfeeding against the potential risks of the drug affecting the child. [2004, amended 2012]

After the Birth

Parents of new babies or young children should be informed that introducing a few simple safety precautions may significantly reduce the risk of accidents and minimise anxiety. An approaching birth can be an ideal opportunity to review and consider the best and most helpful measures to start to ensure maximum safety for both mother and baby. [2004]

Information should be given to all parents about safety precautions to be taken when caring for the baby (see Appendix D* of the full guideline document). [2004]

*Appendix D of the full guideline provides a checklist for the information needs of women and girls with epilepsy, and practical information for mothers with epilepsy.

Parents should be reassured that the risk of injury to the infant caused by maternal seizure is low. [2004]

Children, Young People and Adults with Learning Disabilities (see also the sections 'Women and Girls with Epilepsy' above and 'Young People with Epilepsy' below)

Diagnosis (see also the section 'Diagnosis' above)

It can be difficult to diagnose epilepsy in children, young people and adults with learning disabilities, and so care should be taken to obtain a full clinical history. Confusion may arise between stereotypic or other behaviours and seizure activity. [2004]

It is important to have an eye witness account supplemented by corroborative evidence (for example, a video account), where possible. [2004]

Clear, unbiased reporting is essential. Witnesses may need education to describe their observations accurately. [2004]

Investigations (see also the section 'Investigations' above)

Those with learning disabilities may require particular care and attention to tolerate investigations. [2004]

Facilities should be available for imaging under anaesthesia, if necessary. [2004]

In the child or young person presenting with epilepsy and learning disability, investigations directed at determining an underlying cause should be undertaken. [2004]

Management (see also the section 'Management' above)

Enable children, young people and adults who have learning disabilities, and their family and/or carers where appropriate, to take an active part in developing a personalised care plan for treating their epilepsy while taking into account any comorbidities. [new 2012]

Ensure adequate time for consultation to achieve effective management of epilepsy in children, young people and adults with learning disabilities. [new 2012]

In making a care plan for a child, young person or adult with learning disabilities and epilepsy, particular attention should be paid to the possibility of adverse cognitive and behavioural effects of AED therapy. [2004]

The recommendations on choice of treatment and the importance of regular monitoring of effectiveness and tolerability are the same for those with learning disabilities as for the general population. [2004]

Do not discriminate against children, young people and adults with learning disabilities, and offer the same services, investigations and therapies as for the general population. [new 2012]

Every therapeutic option should be explored in children, young people and adults with epilepsy in the presence or absence of learning disabilities. [2004]

Healthcare professionals should be aware of the higher risks of mortality for children, young people and adults with learning disabilities and epilepsy and discuss these with them, their families and/or carers. [2004]

All children, young people and adults with epilepsy and learning disabilities should have a risk assessment including:

- Bathing and showering
- Preparing food
- Using electrical equipment
- Managing prolonged or serial seizures
- The impact of epilepsy in social settings
- SUDEP
- The suitability of independent living, where the rights of the child, young person or adult are balanced with the role of the carer [2004]

Young People with Epilepsy (see also the section 'Women and Girls with Epilepsy' above)

The physical, psychological and social needs of young people with epilepsy should always be considered by healthcare professionals. Attention should be paid to their relationships with family and friends, and at school. [2004]

Healthcare professionals should adopt a consulting style that allows the young person with epilepsy to participate as a partner in the consultation. [2004]

Decisions about medication and lifestyle issues should draw on both the expertise of the healthcare professional and the experiences, beliefs and wishes of the young person with epilepsy as well as their family and/or carers. [2004]

During adolescence a named clinician should assume responsibility for the ongoing management of the young person with epilepsy and ensure smooth transition of care to adult services, and be aware of the need for continuing multi-agency support. [2004]

Multidisciplinary services provided jointly by adult and paediatric specialists have a key role in the care of the young person with epilepsy. This can facilitate the transition from paediatric to adult services and aid in the dissemination of information. [2004]

Before the transition to adult services is made, diagnosis and management should be reviewed and access to voluntary organisations, such as support groups and epilepsy charities, should be facilitated. [2004]

The information given to young people should cover epilepsy in general and its diagnosis and treatment, the impact of seizures and adequate seizure control, treatment options including side effects and risks, and the risks of injury. Other important issues to be covered are the possible consequences of epilepsy on lifestyle and future career opportunities and decisions, driving and insurance issues, social security and welfare benefit issues, sudden death and the importance of adherence to medication regimes. Information on lifestyle issues should cover recreational drugs, alcohol, sexual activity and sleep deprivation (see the section 'Information' above). [2004]

The diagnosis and management of epilepsy should be reviewed during adolescence. [2004]

Older People with Epilepsy

Do not discriminate against older people, and offer the same services, investigations and therapies as for the general population. [new 2012]

Pay particular attention to pharmacokinetic and pharmacodynamic issues with polypharmacy and comorbidity in older people with epilepsy. Consider using lower doses of AEDs and, if using carbamazepine, offer controlled-release carbamazepine preparations. [new 2012]

Children, Young People and Adults from Black and Minority Ethnic Groups

Children, young people and adults from black and minority ethnic groups may have different cultural and communication needs and these should be considered during diagnosis and management. The need for interpretation should be considered alongside other means of ensuring that a person's needs are appropriately met. [2004]

An interpreter should have both cultural and medical knowledge. Interpreters from the family are generally not suitable because of issues such as confidentiality, privacy, personal dignity, and accuracy of translation. [2004]

Information, including information about employment rights and driving, should be available in an appropriate format or through other appropriate means for children, young people and adults who do not speak or read English. [2004]

Review

Children, young people and adults with epilepsy should have a regular structured review and be registered with a general medical practice. [2004]

Adults should have a regular structured review with their general practitioner (GP), but depending on the person's wishes, circumstances and epilepsy, the review may be carried out by the specialist. [2004]

Children and young people should have a regular structured review with a specialist. [2004]

For adults, the maximum interval between reviews should be 1 year but the frequency of review will be determined by the person's epilepsy and their wishes. [2004]

For children and young people, the maximum interval between reviews should be 1 year, but the frequency of reviews should be determined by the child or young person's epilepsy and their wishes and those of the family and/or carers. The interval between reviews should be agreed between the child or young person, their family and/or carers as appropriate, and the specialist, but is likely to be between 3 and 12 months. [2004]

Adults should have regular reviews. In addition, access to either secondary or tertiary care should be available to ensure appropriate diagnosis, investigation and treatment if the person or clinician view the epilepsy as inadequately controlled. [2004]

Adults with well-controlled epilepsy may have specific medical or lifestyle issues (for example, pregnancy or drug cessation) that may need the advice of a specialist. [2004]

If the structured review is to be conducted by the specialist, this may be best provided in the context of a specialist clinic. [2004]

Treatment should be reviewed at regular intervals to ensure that children, young people and adults with epilepsy are not maintained for long periods on treatment that is ineffective or poorly tolerated and that concordance with prescribed medication is maintained. [2004]

Annual review should include an enquiry about side effects and a discussion of the treatment plan to ensure concordance and adherence to medication. [2004]

At the review, children, young people and adults should have access to: written and visual information; counselling services; information about voluntary organisations; epilepsy specialist nurses; timely and appropriate investigations; referral to tertiary services including surgery, where appropriate. [2004]

Clinical Algorithm(s)

- Outline care algorithms for adults and children and young people with epilepsy are available in Appendix C of the original guideline document.
- Differential diagnosis algorithms for adults and children and young people are available in Appendix D of the original guideline document.
- The recommendations from this guideline have been incorporated into a NICE Pathway.

Scope

Disease/Condition(s)

Epilepsy including:

- Focal seizures
- Generalized tonic-clonic seizures
- Absence epilepsy, absence seizures and other absence syndromes
- Myoclonic seizures
- Tonic and atonic seizures
- Infantile spasms
- Dravet syndrome
- Lennox–Gastaut syndrome
- Benign epilepsy with centrotemporal spikes, Panayiotopoulos syndrome or late-onset childhood occipital epilepsy (Gastaut type)
- Idiopathic generalised epilepsy (IGE)
- Juvenile myoclonic epilepsy
- Landau–Kleffner syndrome
- Myoclonic-astatic epilepsy
- Status epilepticus

Note: An epilepsy is defined as a neurological condition characterised by recurrent epileptic seizures unprovoked by any immediately identifiable cause. An epileptic seizure is the clinical manifestation of an abnormal and excessive discharge of a set of neurons in the brain.

Epilepsy should be viewed as a symptom of an underlying neurological disorder and not as a single disease entity. The term 'epilepsies' is used in the title of the guideline to reflect this.

Guideline Category

Counseling

Diagnosis

Evaluation

Management

Treatment

Clinical Specialty

Emergency Medicine

Family Practice

Internal Medicine

Medical Genetics

Neurology

Nutrition

Obstetrics and Gynecology

Pediatrics

Pharmacology

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Dietitians

Emergency Medical Technicians/Paramedics

Health Care Providers

Hospitals

Managed Care Organizations

Nurses

Patients

Pharmacists

Physician Assistants

Physicians

Public Health Departments

Social Workers

Guideline Objective(s)

To offer best practice advice on the treatment and management of the epilepsies in children, young people and adults with epilepsy

Target Population

Children, young people and adults with epilepsy

Interventions and Practices Considered

Evaluation/Treatment/Management

Overall Approach

1. Having the patient as partner in decision making
2. Comprehensive care plan that includes lifestyle as well as medical issues
3. Appropriate patient education on all aspects of epilepsy, including sudden unexpected death in epilepsy (SUDEP)
4. Expert Patients Programme

Following a First Seizure

1. Initial screening at Accident and Emergency department
2. Referral to specialist
3. Specialist assessment, including a physical examination that addresses cardiac, neurological/mental and developmental status

Diagnosis

1. Detailed history, including an eyewitness account
2. Investigations, including:
    - Electroencephalogram (EEG)
    - Neuroimaging (magnetic resonance imaging [MRI] and computed tomography [CT])

- Other tests
    - Adults: blood tests (e.g., plasma electrolytes, glucose, calcium)
    - Children: blood and urine biochemistry
    - 12 lead electrocardiogram (ECG)
- Neuropsychological assessment

3. Classification using multi-axial diagnostic scheme

Pharmacological Treatment

1. Monotherapy with antiepileptic drug (AED)
2. Combination therapy when monotherapy has not resulted in seizure freedom
3. Steroid (prednisolone or tetracosactide) or vigabatrin for infantile spasms after considering risk-benefit ratio
4. Continuation of treatment
    - Monitoring for adverse effects
    - Blood test monitoring, if indicated
5. Withdrawal of treatment under specialist's care
    - Slow withdrawal over at least 2-3 months
    - One drug at a time
6. Referral to tertiary epilepsy specialist for complex or refractory epilepsy
7. Combining pharmacotherapy with psychological interventions (relaxation, cognitive behaviour therapy, biofeedback)

Other Treatments

1. Ketogenic diet (not recommended in adults; considered as adjunctive treatment in children)
2. Vagus nerve stimulation (VNS)
3. Buccal midazolam (or rectal diazepam) for prolonged or repeated convulsive seizures
4. Intravenous (IV) lorazepam for convulsive sustained epilepticus (IV phenobarbital or phenytoin as second-line treatment)
5. IV midazolam, propofol, or thiopental sodium for refractory convulsive status epilepticus

Special Populations

1. Women and girls
    - Patient education regarding contraception, conception, pregnancy, caring for children, breastfeeding, and menopause
    - Folic acid for women on AEDs
    - Referral to genetic counselling as appropriate
    - Vitamin K parenterally for newborns at delivery for women taking enzyme-inducing AEDs
2. People with learning disabilities
    - Full clinical history with eye witness account supported by corroborative evidence
    - Personalised care plan and risk assessment
3. Young people with epilepsy: consideration of physical, psychological, and social needs
4. Older people with epilepsy: pharmacokinetic and pharmacodynamic issues
5. People from black and minority ethnic groups: consideration of cultural and communication needs

Major Outcomes Considered

- Incidence and prevalence of epilepsy
- Seizure frequency
- Seizure freedom
- Adverse effects or continued seizures with drug therapy
- Quality of life
- Cost-effectiveness

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Searches of Unpublished Data

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Literature Search Strategy

The aim of the literature search was to update the relevant evidence from the 2004 guideline and to identify new 'evidence within the published literature,' to answer the clinical review questions (see the "Description of Methods Used to Formulate the Recommendations" field) as per The NICE Guidelines Manual 2009 (see the "Availability of Companion Documents" field). Clinical databases were searched using relevant medical subject headings, free-text terms and study type filters where appropriate. Non-English studies were not reviewed and were therefore excluded from searches. Where possible, searches were restricted to articles published in English language. All searches were conducted on core databases, Medline, EMBASE, CINAHL and The Cochrane Library. Initial searches for each section were performed when the literature was needed for the review. Each search was updated 3 months and 6 weeks before the end of guideline development period. No papers indexed in the databases after this date were considered.

Search strategies were checked by looking at reference lists of relevant key papers, checking search strategies in other systematic reviews and asking the Guideline Development Group (GDG) for known studies. The search strategies along with the databases searched and the years covered can be found in Appendix J of the full guideline document.

During the scoping stage, a search was conducted for guidelines and reports on the websites listed below and on organisations relevant to the topic. Searching for grey literature or unpublished literature was not systematically undertaken. All references sent by stakeholders were considered.

- Constituent websites of the Guidelines International Network database (www.g-i-n.net)
- National Guideline Clearinghouse (www.guideline.gov/)
- National Institute for Health and Clinical Excellence (NICE) (www.nice.org.uk)
- National Institutes of Health Consensus Development Program (consensus.nih.gov/)
- National Library for Health (www.library.nhs.uk/)

Quality Assessment for Intervention Studies

For each clinical question the highest level of evidence was sought. The GDG included only randomised controlled trials (RCTs) as they are considered the most robust type of a study design that could produce an unbiased estimate of the intervention effects. Where an appropriate RCT (double blinded, single blinded or unblinded) was identified, the GDG did not search for studies of a weaker design. The quality assessment criteria as listed in the NICE Guidelines Manual 2009 (see the "Availability of Companion Documents" field) were used to assess systematic reviews, meta-analyses, and randomised controlled trials. For RCTs, the main criteria considered were:

- An appropriate and clearly focused question was addressed
- Appropriate randomisation, allocation and concealment methods were used
- Subjects, investigators and outcomes assessors were masked about treatment allocation
- The intervention and control groups are similar at baseline
- The only difference between group is the type of intervention received
- All outcomes are measured in a standard and reliable method
- Drop out rates were reported and are acceptable, and all participants are analysed in the groups to which they were randomly allocated the treatment

- For multi-centred trials, results are comparable between sites

Health Economics

Literature searches were also undertaken to identify health economic evidence within published literature relevant to the review questions. The evidence was identified by conducting a broad search relating to the guideline population in the NHS economic evaluation database (NHS EED), the Health Economic Evaluations Database (HEED) and health technology assessment (HTA) databases with no date restrictions. Additionally, the search was run on MEDLINE and EMBASE, with a specific economic filter. Studies published in languages other than English were not reviewed. Where possible, searches were restricted to articles published in English language.

The search strategies for health economics are included in Appendix J of the full guideline document. All searches were updated on prior to consultation. No papers published indexed in the databases after this date were considered.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Overall Quality of Outcome Evidence in Grades of Recommendation Assessment, Development, and Evaluation (GRADE)

Level	Description
High	Further research is very unlikely to change confidence in the estimate of the effect.
Moderate	Further research is likely to have an important impact on confidence in the estimate of the effect and may change the estimate.
Low	Further research is very likely to have an important impact on confidence in the estimate of the effect and is likely to change the estimate.
Very low	Any estimate of effect is very uncertain.

Methods Used to Analyze the Evidence

Meta-Analysis of Randomized Controlled Trials

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

Grading of Recommendations Assessment, Development and Evaluation (GRADE)

The evidence for outcomes from studies which passed the quality assessment were evaluated and presented using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group (http://www.gradeworkinggroup.org/). The software (GRADEpro) developed by the GRADE working group was used to assess pooled outcome data using individual study quality assessments and results from meta-analysis.

The summary of findings for each clinical question was presented as two separate tables in this guideline. The 'Clinical Study Characteristics' table includes details of the quality assessment while the 'Clinical Summary of Findings' table includes pooled outcome data, an absolute measure of intervention effect calculated and the summary of quality of evidence for that outcome. In this table, the columns for intervention and control indicate pooled sample size for continuous outcomes. For binary outcomes such as number of patients with an adverse event, the event rates (n/N) are shown with percentages. Reporting or publication bias was considered in the quality assessment but not included in the Clinical Study Characteristics table because this was a rare reason for downgrading an outcome in this guideline.

Each outcome was examined separately for the quality elements listed and each graded using the quality levels listed in Section 2.8 of the full guideline document (see also the "Rating Scheme for the Strength of the Evidence" field). The main criteria considered in the rating of these elements are discussed in the literature reviewing process (see Section 2.8, 'Grading of Evidence,' in the full guideline document; see also the "Rating Scheme for the Strength of the Evidence" field). Footnotes were used to describe reasons for grading a quality element as having serious or very serious problems.

The GRADE toolbox is currently designed only for randomised controlled trials and observational studies.

Methods of Combining Studies

Where possible and appropriate, meta-analyses were conducted to combine the results of studies for each clinical question using Cochrane Review Manager (RevMan5) software. Fixed-effects (Mantel-Haenszel) techniques were used to calculate risk ratios (relative risk) for the binary outcomes and the continuous outcomes were analysed using an inverse variance method for pooling weighted mean differences. Statistical heterogeneity was assessed by considering the chi-squared test for significance at $p<0.05$ or an I-squared inconsistency statistic of >50% to indicate significant heterogeneity.

Where appropriate, sensitivity analyses based on the quality of studies were carried out to explore the impact of including crossover and unblinded studies, and their findings informed the evidence review and Guideline Development Group (GDG) considerations of the evidence.

Time to event data were summarised using methods of survival analysis. The intervention effect was expressed as a hazard ratio (HR) following the proportional hazards assumption (an assumption that hazard ratio is constant across the follow-up period). Where appropriate, hazard ratios and variances for time to event outcomes were pooled according to the inverse of variance method with the use of Review Manager software.

The 2012 version of the guideline was a partial update of the 2004 version and centred on an update of the pharmacological management (also applicable to people with learning disabilities, older people and pregnant women) and the section on ketogenic diet. The evidence reviews conducted as part of the guideline development followed the agreed reviewing protocol outlined in detail in Section 2.7 of the full guideline document.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Clinical Guideline Centre (NCGC) on behalf of the National Institute for Health and Clinical Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance.

The Guideline Development Group

A Chair was appointed for the group and his primary role was to facilitate and chair the Guideline Development Group (GDG) meetings. The GDG consisted of a diverse multidisciplinary group with an interest and/or expertise in the pharmacological management of the epilepsies.

Professional registered stakeholder organisations were written to notify them of the advertisement and recruitment process. Once all of the applications were received, the NCC-PC Clinical Director, chairman and the project lead selected the individual members, on the basis of their curricula vitae, supporting statements, and against a selection criteria adapted from the person specification and job description.

For the patient members, the Public and Patient Involvement Programme (PPIP) at NICE submitted the received applications, from which the NCC-PC Clinical Director, chairman and the project lead chose two as patient members based on the aim (as with the professional healthcare applicants) of including as wide a range as possible of expertise, experience, and geographic representation from across England and Wales.

Developing Key Clinical Questions (DKQs)

A total of 22 new KCQs were identified; Seventeen key clinical questions focused on the effectiveness and cost-effectiveness of AEDs and had common stems for children and adults; Three key clinical questions specifically addressed children; two of these key clinical questions addressed the effectiveness and cost effectiveness of AEDs in treating children with childhood absence epilepsy and children with infantile spasms. The third key clinical question assessed the clinical effectiveness and cost-effectiveness of treating children with the ketogenic diet; One key clinical question focused on the clinical effectiveness, cost effectiveness of AEDs and the safety of their use in pregnant women and women currently breastfeeding; One key clinical question addressed which AEDs are the most well tolerated for older people, who, for the purposes of this guideline, were defined as those aged 65 years and over.

Full literature searches, critical appraisals and evidence reviews were completed for all the specified clinical questions, with the exception of one subgroup for the clinical question: "Which AEDs are clinically effective, cost effective and safest for use in pregnancy?" The subgroup addressed women who were currently breast-feeding.

Developing Recommendations

Four main areas were considered in the GDG discussions relating to interpreting evidence to make recommendations. These were: relative value placed on the outcomes considered important for decision making; balancing the clinical benefits and harms of an intervention; including cost effectiveness (economic considerations) and assessing the quality of evidence (potential bias and uncertainty in the clinical and economic evidence). Lastly, the GDG had the obligation to include other considerations in relation to their responsibilities under equalities legislation and NICE's equality scheme (www.nice.org.uk/aboutnice/howwework/NICEEqualityScheme.jsp).

Over the course of the guideline development process, the GDG was presented with the following:

- Evidence tables of the clinical and economic evidence reviewed. All evidence tables are in Appendix L of the full guideline document.
- Summary of clinical evidence and quality (as presented in evidence review section in Appendix N of the full guideline document).
- A description of the methods and results of the cost-effectiveness analysis (Appendices P-S in the full guideline document)

Recommendations were drafted on the basis of this evidence whenever it was available. When clinical and economic evidence was poor or absent, the GDG drafted recommendations based on their clinical expertise. The GDG added supporting recommendations whenever it was necessary in order to improve clinical practice. The supporting recommendations were not derived from clinical questions and were based on GDG expert opinion. The development of the recommendations required several steps:

- Whenever possible, a preliminary draft recommendation was presented by NCGC staff after each summary of evidence presentation during GDG meetings. This draft was discussed and modified by the group to form the first draft recommendation.
- Where necessary, NCGC staff suggested modifications to the draft recommendations as a result of the discussion and in the light of NICE guidance on writing recommendations.
- Towards the end of the guideline development process, a list of all the draft recommendations was sent to the GDG members. The GDG members independently completed a consensus exercise to feedback comments and level of agreement on each recommendation. This procedure allowed the NCGC to verify the level of agreement between the GDG members.
- All GDG feedback was collated and circulated again to the GDG. The recommendations which did not have unanimous agreement were discussed again during a GDG meeting before being finalised.
- During the writing up phase of the guideline, the GDG could further refine each recommendation working in subgroups on each chapter.
- NCGC staff verified the consistency of all recommendations across the guideline.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

See the full guideline document for cost-effectiveness information, particularly the health economic evidence sections in Section 10, 'Pharmacological Treatment of Epilepsy'.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The external review process for this guideline remains as per the 2004 guideline. The 2012 guideline development process has followed the guidance contained within the NICE Guidelines Manual (2009).

In addition, the final draft of the guideline was reviewed by expert peer reviewers and an independent Guideline Review Panel (GRP) established by the Institute. A further step was added following the GRP review: an external pre-publication consultation process was undertaken to allow for factual inaccuracies to be corrected prior to publication.

The comments made by the stakeholders, peer reviewers and the GRP were collated and presented anonymously for consideration by the GDG. All comments were considered systematically by the GDG and the project team recorded the agreed responses.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Optimal management of epilepsy improves health outcomes and can also help to minimise other, often detrimental, impacts on social, educational and employment activity.

Potential Harms

- Adverse effects of antiepileptic drugs (AEDs)
- *Misdiagnosis*: Individuals misdiagnosed with epilepsy may experience social and financial deprivation as a result of having the wrong diagnostic label and from side-effects of antiepileptic medication. In addition, there may be a risk of unnecessary teratogenicity as a result of AED therapy in women incorrectly diagnosed as having epilepsy. In a small number of cases, individuals may die prematurely because the correct diagnosis was not made, and a serious condition was neither diagnosed nor treated. Individuals who have symptoms due to epileptic seizures but who are wrongly diagnosed as having psychiatric or associated disorders are disadvantaged from being labelled with an incorrect diagnosis and by the effects of continuing seizure activity because AEDs are not used. It is therefore crucial that specialists involved in diagnosing epilepsy take great care to establish the correct diagnosis.
- *Special Populations*: An increasing population is the elderly, in whom the incidence of new onset epilepsy is increasing, although the possibility of misdiagnosis also remains high. Special consideration needs to be given when prescribing any medication within this population, not least because of drug interaction and pharmacokinetic issues, and this similarly applies to antiepileptic medication. Increasing information is also being gathered on the effect of antiepileptic drugs taken by a mother on the unborn child; further data have to be accumulated to ensure accurate information on treatment and its possible effects are given to a woman prior to conception so she is able to make choices.

Contraindications

Contraindications

There are contraindications to prescribing carbamazepine to some people of Han Chinese or Thai origin.

Qualifying Statements

Qualifying Statements

- This guidance represents the view of the National Institute of Health and Clinical Excellence (NICE), which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.
- Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.
- This guideline recommends some drugs for indications for which they do not have a UK marketing authorisation at the date of publication, if there is good evidence to support that use. Where recommendations have been made for the use of drugs outside their licensed indications ('off-label use'), these drugs are marked with a footnote in the recommendations.

Implementation of the Guideline

Description of Implementation Strategy

Implementation

The National Institute of Health and Clinical Efficacy (NICE) has developed tools to help organisations implement this guidance (see http://guidance.nice.org.uk/CG137).

Key Priorities for Implementation

The following recommendations have been identified as key priorities for implementation.

Diagnosis

- All children, young people and adults with a recent onset suspected seizure should be seen urgently* by a specialist**. This is to ensure precise and early diagnosis and initiation of therapy as appropriate to their needs.

Management

- Healthcare professionals should adopt a consulting style that enables the child, young person or adult with epilepsy, and their family and/or carers as appropriate, to participate as partners in all decisions about their healthcare, and take fully into account their race, culture and any specific needs.
- All children, young people and adults with epilepsy should have a comprehensive care plan that is agreed between the individuals, their family and/or carers as appropriate, and primary and secondary care providers.
- The antiepileptic drug (AED) treatment strategy should be individualised according to the seizure type, epilepsy syndrome, co-medication and co-morbidity, the child, young person or adult's lifestyle, and the preferences of the individual, their family and/or carers as appropriate.

Prolonged or Repeated Seizures and Convulsive Status Epilepticus

- Only prescribe buccal midazolam or rectal diazepam*** for use in the community for children, young people and adults who have had a previous episode of prolonged or serial convulsive seizures.
- Administer buccal midazolam as first-line treatment in children, young people and adults with prolonged or repeated seizures in the community. Administer rectal diazepam*** if preferred or if buccal midazolam is not available. If intravenous access is already established and resuscitation facilities are available, administer intravenous lorazepam.

Special Considerations for Women and Girls of Childbearing Potential

- Women and girls with epilepsy and their partners, as appropriate, must be given accurate information and counselling about contraception, conception, pregnancy, caring for children, breastfeeding and menopause.

Review and Referral

- All children, young people and adults with epilepsy should have a regular structured review. In children and young people, this review should be carried out at least yearly (but may be between 3 and 12 months by arrangement) by a specialist. In adults, this review should be carried out at least yearly by either a generalist or specialist, depending on how well the epilepsy is controlled and/or the presence of specific lifestyle issues.
- At the review, children, young people and adults should have access to: written and visual information; counselling services; information about voluntary organisations; epilepsy specialist nurses; timely and appropriate investigations; referral to tertiary services, including surgery if appropriate.
- If seizures are not controlled and/or there is diagnostic uncertainty or treatment failure, individuals should be referred to tertiary services soon**** for further assessment.

*The Guideline Development Group considered that 'urgently' meant being seen within 2 weeks.
**For adults, a specialist is defined throughout as a medical practitioner with training and expertise in epilepsy. For children, a specialist is defined throughout as a paediatrician with training and expertise in epilepsy.
***At the time of publication (January 2012), this drug did not have United Kingdom (UK) marketing authorisation for this indication and/or population (see Appendix E of the original guideline document for details). Informed consent should be obtained and documented in line with normal standards in emergency care.
****The Guideline Development Group considered that 'soon' meant being seen within 4 weeks.

Implementation Tools

Audit Criteria/Indicators

Clinical Algorithm

Foreign Language Translations

Patient Resources

Quick Reference Guides/Physician Guides

Resources

Slide Presentation

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

National Institute for Health and Clinical Excellence (NICE). The epilepsies: the diagnosis and management of the epilepsies in adults and children in primary and secondary care. London (UK): National Institute for Health and Clinical Excellence (NICE); 2012 Jan. 117 p. (Clinical guideline; no. 137).

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

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Guideline Developer(s)

National Collaborating Centre for Primary Care - National Government Agency [Non-U.S.]

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Guideline Committee

Guideline Development Group

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Financial Disclosures/Conflicts of Interest

In accordance with guidance from National Institute for Health and Clinical Excellence (NICE), all Guideline Development Group (GDG) members and the chair declared in writing interests that covered consultancies, fee-paid work, share-holdings, fellowships, and support from the healthcare industry and these were made available in the public domain. Details of these can be seen in Appendix U of the full guideline. Declaration of interests were updated at the start of each GDG meeting. A record of updated declarations of interest was recorded in the National Clinical Guidelines Centre's (NCGC's) database and minutes of each meeting were produced. The minutes of the GDG meetings were published on the NICE website within 10 weeks of being agreed by the GDG.

Guideline Status

This is the current release of the guideline.

This guideline updates previous versions:

National Collaborating Centre for Primary Care. The diagnosis and management of the epilepsies in adults and children in primary and secondary care. London (UK): Royal College of General Practitioners; 2004 Oct. 525 p. [324 references]

National Institute for Clinical Excellence (NICE). Newer drugs for epilepsy in adults. London (UK): National Institute for Clinical Excellence (NICE); 2004 Mar. 36 p. (Technology appraisal; no. 76).

National Institute for Clinical Excellence (NICE). Newer drugs for epilepsy in children. London (UK): National Institute for Clinical Excellence (NICE); 2004 Apr. 39 p. (Technology appraisal; no. 79).

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site .

Availability of Companion Documents

The following are available:

- The epilepsies: the diagnosis and management of the epilepsies in adults and children in primary and secondary care. Full guideline. London (UK): National Institute for Health and Clinical Excellence; 2012 Jan. 636 p. (Clinical guideline; no. 137). Electronic copies: Available in Portable Document Format (PDF) from the National Institute for Health and Clinical Excellence (NICE) Web site .
- The epilepsies: the diagnosis and management of the epilepsies in adults and children in primary and secondary care. Appendices. London (UK): National Institute for Health and Clinical Excellence; 2012 Jan. Various p. (Clinical guideline; no. 137). Electronic copies: Available in PDF from the NICE Web site .
- NICE pathways. Epilepsy overview. Electronic copies: Available from the NICE Web site .
- The epilepsies: the diagnosis and management of the epilepsies in adults and children in primary and secondary care. Costing statement. London (UK): National Institute for Health and Clinical Excellence; 2012 Jan. 10 p. (Clinical guideline; no. 137). Electronic copies: Available in PDF from the NICE Web site .
- The epilepsies. Clinical audit tools. London (UK): National Institute for Health and Clinical Excellence; 2012 Jan. Clinical guideline; no. 137). Electronic copies: Available from the NICE Web site .
- The epilepsies. Electronic audit tools. London (UK): National Institute for Health and Clinical Excellence; 2012 Jan. Clinical guideline; no. 137). Electronic copies: Available from the NICE Web site .
- The epilepsies. Slide set. London (UK): National Institute for Health and Clinical Excellence; 2012 Jan. 73 p. (Clinical guideline; no. 137). Electronic copies: Available from the NICE Web site .
- The epilepsies. Baseline assessment tool. London (UK): National Institute for Health and Clinical Excellence; 2012. (Clinical guideline; no. 137). Electronic copies: Available from the NICE Web site .
- The epilepsies: Support for education and learning: clinical case scenarios – Adults with epilepsy. London (UK): National Institute for Health and Clinical Excellence; 2012 Feb. 48 p. (Clinical guideline; no. 137). Electronic copies: Available from the NICE Web site

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- The epilepsies: Support for education and learning: clinical case scenarios – Adults with epilepsy. Slide set. London (UK): National Institute for Health and Clinical Excellence; 2012 Feb. 68 p. (Clinical guideline; no. 137). Electronic copies: Available from the NICE Web site .
- The epilepsies: Support for education and learning: clinical case scenarios – Children and young people with epilepsy. London (UK): National Institute for Health and Clinical Excellence; 2012 Feb. 40 p. (Clinical guideline; no. 137). Electronic copies: Available from the NICE Web site .
- The epilepsies: Support for education and learning: clinical case scenarios – Children and young people with epilepsy. London (UK): National Institute for Health and Clinical Excellence; 2012 Feb. 42 p. (Clinical guideline; no. 137). Electronic copies: Available from the NICE Web site .
- The epilepsies. Pharmacological treatment tables. London (UK): National Institute for Health and Clinical Excellence; 2012. (Clinical guideline; no. 137). Electronic copies: Available from the NICE Web site .
- The guidelines manual 2009. London (UK): National Institute for Health and Clinical Excellence (NICE); 2009 Jan. Electronic copies: Available in PDF from the NICE Archive Web site .

Patient Resources

The following is available:

- The diagnosis and management of epilepsy in children, young people and adults. Understanding NICE guidance: information for people who use NHS services. London (UK): National Institute for Clinical Excellence. 2012 Jan. 28 p. Available in Portable Document Format (PDF) from the National Institute for Clinical Excellence (NICE) Web site . Also available in Welsh from the NICE Web site .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI on February 7, 2005. The information was verified by the guideline developer on March 23, 2005. This summary was updated by ECRI on April 21, 2005 following the release of a public health advisory from the U.S. Food and Drug Administration (FDA) regarding Trileptal (oxcarbazepine). This summary was updated by ECRI on November 16, 2006, following the FDA advisory on Lamictal (lamotrigine). This summary was updated by ECRI Institute on January 10, 2008, following the U.S. Food and Drug Administration advisory on Carbamazepine. This summary was updated by ECRI Institute on May 1, 2009 following the U.S. Food and Drug Administration advisory on antiepileptic drugs. This summary was updated by ECRI Institute on January 8, 2010 following the U.S. Food and Drug Administration advisory on Valproate sodium. The information was reaffirmed by the guideline developer on February 9, 2009 and updated by ECRI Institute on March 31, 2010. This summary was updated by ECRI Institute on September 15, 2010 following the U.S. Food and Drug Administration advisory on Lamictal (lamotrigine). This summary was updated by ECRI Institute on April 13, 2011 following the U.S. Food and Drug Administration advisory on Topamax (topiramate). This NGC summary was updated by ECRI Institute on June 29, 2012. This summary was updated by ECRI Institute on July 10, 2013 following the U.S. Food and Drug Administration advisory on Valproate. This summary was updated by ECRI Institute on October 21, 2016 following the U.S. Food and Drug Administration advisory on opioid pain and cough medicines combined with benzodiazepines.

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